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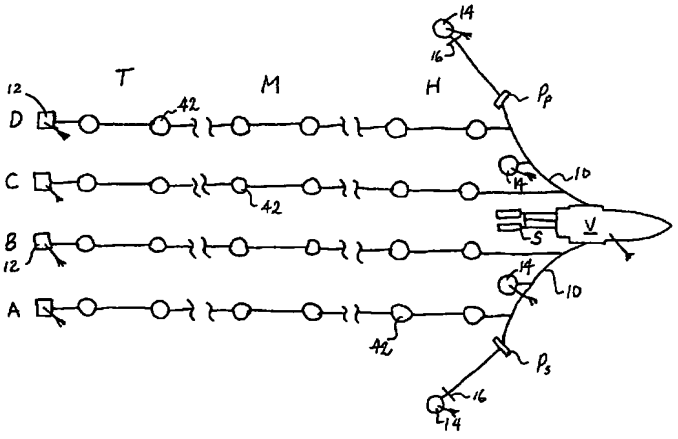
(54) Title: GPS-BASED UNDERWATER CABLE POSITIONING SYSTEM



(57) Abstract: A GPS-based underwater cable positioning system for use in determining the shape and position of hydrophone streamers towed underwater behind survey vessels involved in marine seismic prospecting. The system includes a plurality of surface units towed behind the vessel. Each surface unit includes a GPS receiver to receive radio frequency GPS signals and to determine its positions. Each surface unit also has an acoustic transmitter to transmit an acoustic message signal representing its position and an optional time stamp into the water. Acoustic receiver units, attached spaced apart locations along one or more streamer cables, each include an acoustic receiver to receive the acoustic message signals from the surface units and to determine its position from the message signals. To augment the message signals from the surface units at locations distant from the surface units, acoustic transceiver units may be used. The acoustic transceiver units are attached to the streamer cables at ranges between the surface units and distant acoustic receiver units. The acoustic transceiver units each include an acoustic receiver that performs as the receivers in the acoustic receiver units and an acoustic transmitter to transmit acoustic message signals representing its position and an optional time stamp into the water to be received by the acoustic receiver units. In this way, the positions and shapes of towed streamer cables can be determined.

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